English

HA-8700

STEREO AMPLIFIER

INSTRUCTION MANUAL

Congratulations!

HITACHI Hi-Fi products are the proud result of HITACHI engineering, research and development, and over 50 years of experience in electronics. Laboratories and major testing facilities are maintained in Tokyo and Toyokawa, Japan.

In choosing this fine HITACHI Hi-Fi product you have demonstrated an acute awareness of "getting the best for your money". With HITACHI products this is not an idle boast.

KEY TO ILLUSTRATIONS

① POWER switch
② POWER indicator
③ PROTECTION indicator
④ PHONES jack
⑤ SPEAKERS OFF switch
⑥ MAIN DIRECT switch
⑦ MUTING switch
⑧ LOW-FILTER switch
⑨ BALANCE control
⑩ Volume control (LEVEL ATTENUATOR)
⑪ TAPE MONITOR switch
⑫ FUNCTION switch
⑬ PHONO SELECTOR switches
⑭ MODE switch
⑮ TREBLE turnover switch
⑯ TREBLE control
⑰ BASS control
⑱ BASS turnover switch
⑲ SPEAKERS switch
⑳ Lid
㉑ PHONO-1 INPUT terminals
㉒ PHONO-2 INPUT terminals
㉓ TUNER INPUT terminals
㉔ AUX INPUT terminals
㉕ TAPE 1 REC terminals
㉖ TAPE 1 PLAY terminals
㉗ TAPE 2 DIN REC/PLAY socket (except U.S.A. & Canada sets)
㉘ TAPE 2 REC terminals (for U.S.A. & Canada sets only)
㉙ TAPE 2 PLAY terminals (for U.S.A. & Canada sets only)
㉚ PRE OUT terminals
㉛ MAIN IN terminals
㉜ DIRECT COUPLING/CONDENSER COUPLING switch
㉝ Ground terminal (GND)
㉞ SPEAKERS terminals
㉟ VOLTAGE SELECTORS (for Asia & Latin American countries)
㊱ AC outlet (SWITCHED 50 Watts Max.) (for U.S.A. & Canada sets only)
㊲ AC outlets (UNSWITCHED TOTAL 100 Watts Max.) (for U.S.A. & Canada sets only)
㊳ Power supply cord

SAFEGUARD

Electrical energy can perform many useful functions. This unit has been engineered and manufactured to assure your personal safety. Improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards, observe the following instructions for its installation, use and servicing.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Important for U.K.:
WARNING: This apparatus must be earthed.
The wires in this mains lead are coloured in accordance with the following code:

Green and Yellow	: EARTH
Blue	: NEUTRAL
Brown	: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows. The wire which is coloured GREEN and YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN and YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

INSTALLATION

Please bear in mind the following points when installing the HA-8700.
1. Install it in a place free from direct sunlight and heat from a stove, etc.
2. Since the HA-8700 incorporates a large power output amplifier, choose a well ventilated, moisture-free place.
3. Install the receiver on a stable and vibration-free surface.

1. Placement on an ordinary shelf

Correct

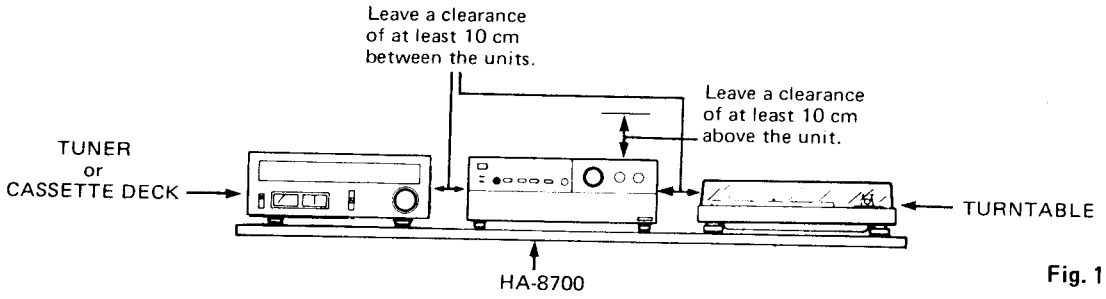


Fig. 1

NOTES:
1. This unit is a high-output stereo amplifier and so it generates a great deal of heat when operating. Therefore, choose a well ventilated location for installation. Install the units as illustrated in Fig. 1. When using the power amplifier at high-output power levels, the top cover will heat up and so it is not advisable to touch this cover.

Incorrect

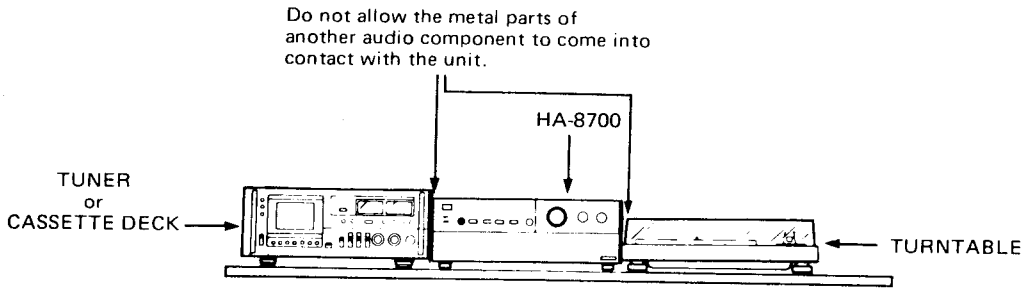


Fig. 2

2. Hum noise is sometimes generated if the metal parts (like a cover) of another audio component or metal rack come into contact with the unit, as shown in Fig. 2.
3. When a tape deck is placed close to this unit or it is placed on this unit, inductive hum may be generated. If it happens, change the places of each unit or keep the tape deck away the unit.

2. Rack installation

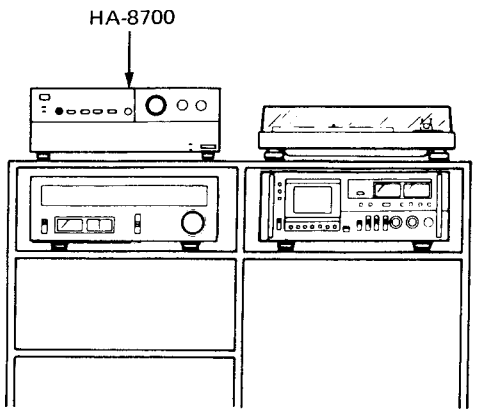


Fig. 3 (Installation in horizontal rack)

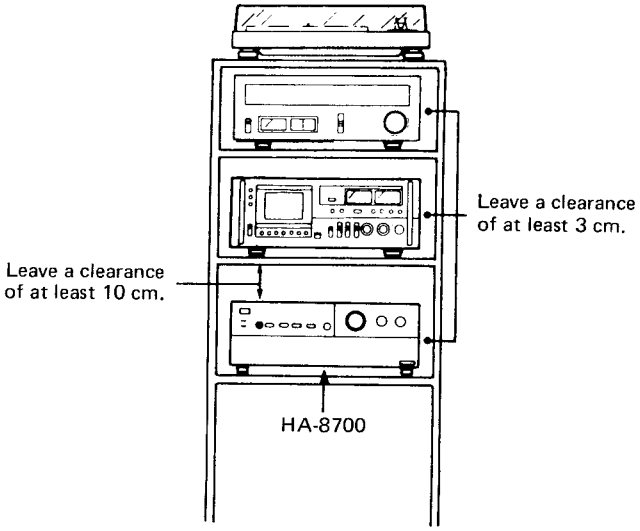


Fig. 4 (Installation in vertical rack)

NOTES:

1. If your audio rack is enclosed and poorly ventilated or when you use the HA-8700 at high output power levels, do not install this unit inside the rack.
   In case you need to install this unit inside the rack, be sure to leave a clearance of at least 10 cm above the unit and at least 3 cm beside the unit as shown in Fig. 4.
2. When inductive hum is generated during tape play, change the place of the deck or keep it away the amplifier.

IMPORTANT NOTICE

This model is so designed that the performance of the POWER MOS FET is displayed to the full. The surface of the amplifier, therefore, will heat up and so air should be allowed to circulate freely. Do not stack another audio component on top of the amplifier or install it in a rack with poor ventilation. In particular, remember to leave a clearance of at least 10 cm above the amplifier to allow the air to circulate when operating it continuously at high outputs. Also remember to leave a clearance of at least 10 cm at the side when installing a tape deck or turntable, otherwise hum may result.

FEATURES

HITACHI has developed a complementary POWER MOS FET which displays superb characteristics as a power amplification device for audio applications. Since both the N-channel and P-channel complementary characteristics of this POWER MOS FET are top-class, this model features a simple 3-stage circuit configuration including the power amplification stage. This is a design which makes for a low distortion across a wide band and which is devoted to engineering only the best in sound quality.

1. Design oriented toward low distortion across wide band for the best in sound quality

The POWER MOS FET features a high input impedance and it is a voltage driven device. These two merits provide a high power gain and a simply designed circuit configuration. This is why there is minimal noise or phase drift which has an adverse affect on the sound quality, and also why there is no deterioration in the distortion factor. In addition, the frequency response is excellent, the switching speed is fast, stable operation is ensured even in the high frequencies and notch distortion is dramatically reduced. The design makes for a low distortion factor across a wide band with a continuous power output of 90 watts per channel, min., at 8 ohms (20 Hz – 20 kHz) with no more than 0.02% total harmonic distortion.

2. **MAIN DIRECT switch that allows the main amplifier to do full justice to its sound quality**
In order to make the most of the excellent sound quality of this main amplifier with its POWER MOS FET, a superior device for audio reproduction, a MAIN DIRECT switch is featured. This directly connects the main amplifier stage to the equalizer output and raises the gain of the main amplifier. In addition, by reducing the gain of the main amplifier to a value yielded when the MAIN DIRECT switch is at OFF, using the MUTING switch, it is possible to reproduce a high quality sound.

3. **DC amplifier enabling accurate waveform transmission**
This model features a DC amplifier configuration throughout in the MC head amplifier, equalizer amplifier, tone amplifier and main amplifier. Capacitors have been eliminated from the negative feedback loop and even from the input circuitry. This feature contributes to an enhancement of the phase characteristic.

4. **Left and right independent power supplies**
Left and right separate power transformers are adopted, two smoothing capacitors with a large capacitance for each channel are added, and regulated power supplies are used for each stage of small-signal amplification. These features serve to cancel out any mutual interference produced through the power supplies, they keep transient crosstalk down to the bare minimum, and they make it possible to achieve an extremely lucid music reproduction.

5. **MC head amplifier and equalizer amplifier for improved S/N ratio**
This model contains an MC head amplifier which allows moving coil (MC) cartridges to be connected directly. Thanks to a low-noise FET (field effect transistor) and 4 transistors in the pure complementary push-pull circuit, this head amplifier provides a signal-to-noise ratio of 73 dB and a distortion of 0.005% (REC OUT 20 Hz – 20 kHz 10 V output).
The equalizer amplifier adopts 8-transistor pure complementary push-pull circuit with 2 low-noise FETs configured as a differential circuit in the first stage. This design yields a signal-to-noise ratio of 90 dB and a distortion of 0.005% (REC OUT 20 Hz – 20 kHz 10 V output).
Furthermore, the RIAA deviation is ± 0.2 dB across a frequency range of 20 Hz to 20 kHz and the PHONO overload level is 300 mV (MM: at 1 kHz T.H.D. 0.005%). This makes for music reproduction with plenty of headroom.

6. **Low-impedance design**
Two power relays, which also serve as protective relays for speakers A and B, function to select the speakers, and the direct output terminals are used for direct connections to the speaker terminals. Printed wiring boards with 70 μ thick copper pattern – double conventional dimensions – are employed in the power supply and main amplifier sections of the output stage which are subject to large current surges. A low impedance design is featured all the way from the power line to the output line.

7. **PHONO SELECTOR switch adopted**
Moving coil (MC) or moving magnet (MM) cartridges may be connected to either the PHONO-1 or PHONO-2 terminals, and these can be selected by the front panel PHONO SELECTOR switch. Furthermore, when a moving magnet cartridge has been connected, the load resistance and load capacitance can be set to any of four stages which allows you to derive listening pleasure from subtle changes in the sound quality.

8. **High-reliability protection circuitry**
In order to protect the POWER MOS FET, a current limiter circuit which relies on the detection of the area of safe operation and DC voltage detection circuit have been installed. This circuitry features high reliability which enables it to cope with accidents.

9. **High-quality parts employed**
The sound quality of the music reproduced is greatly affected by the quality of the parts used in an amplifier. This is why this particular model uses only the best capacitors, resistors and switches. In particular, the capacitors have undergone extensive tests in order to determine the exact type and capacitance which are best suited for the location in the amplifier where they will be used.

10. **Simple but deluxe design**
Minimum functions which are required for music reproduction are located on the upper half of the front panel, and all the other functions are positioned underneath. The lid can be opened and closed. When closed, the amplifier takes on a simple look but when open it gives a solid and deluxe feeling.

CONTROLS AND SWITCHES

① **POWER switch**
When this switch is depressed (⊏), power is supplied to the amplifier, and the POWER indicator (green) ② and PROTECTION indicator (red) ③ come on. Because of the built-in muting circuit, the protection indicator (red) goes off about 4 to 7 seconds after the power has been switched on, and the amplifier is set to the normal operation mode.

② **POWER indicator**
This lights up (green) when the POWER switch ① is depressed (⊏).

③ **PROTECTION indicator**
This red indicator comes on 4 to 7 seconds after the POWER switch ① has been depressed (⊏), or when the protection circuit has been actuated.

④ PHONES jack

Insert the plug of the stereo headphones into this jack. If you want to listen with the headphones only, set the SPEAKERS OFF switch ⑤ to depressed (⊐).

⑤ SPEAKERS OFF switch

When the SPEAKERS OFF switch is depressed (⊐), the green indicator above the switch comes on and the sound is no longer heard through the speakers.

Use this switch for headphones listening only. Set the switch to the released (□) position when you want to listen to the sound through both the headphones and the speakers (the indicator goes off), and set the SPEAKERS switch ⑲ to A, B or A + B.

⑥ MAIN DIRECT switch

This switch is provided in order to make the most of the sound quality of the superior POWER MOS FET main amplifier.

When this switch is set to the depressed (⊐) position, the green indicator above the switch comes on, and the signals from the TUNER INPUT terminals ㉓ and the equalizer output signals etc. are connected directly to the main amplifier without passing through the tone amplifier.

By setting the MUTING switch ⑦ to the depressed (⊐) position, it is possible to reduce the main amplifier gain to a level equivalent to the one when the MAIN DIRECT switch is set to the released (□) position, and to achieve a high quality reproduction of music.

NOTE 1:

The rear panel MAIN IN terminals ㉛ cannot be used when the MAIN DIRECT switch is set to the depressed (⊐) position.

NOTE 2:

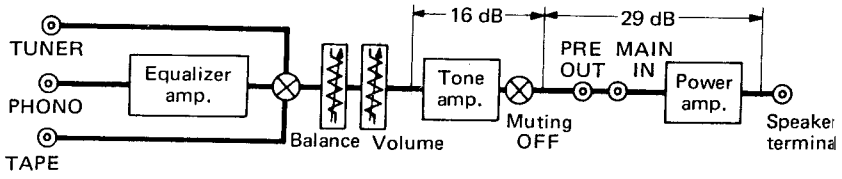
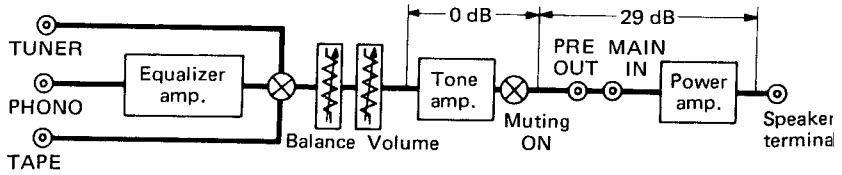
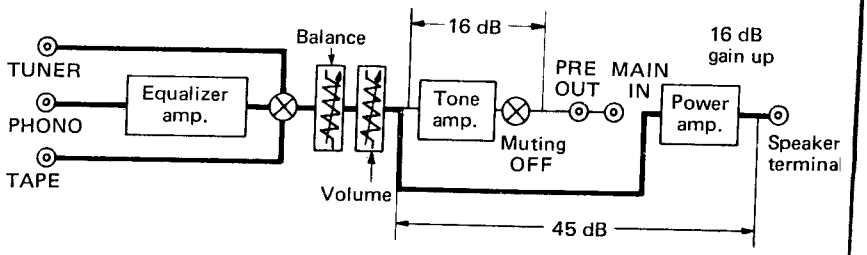
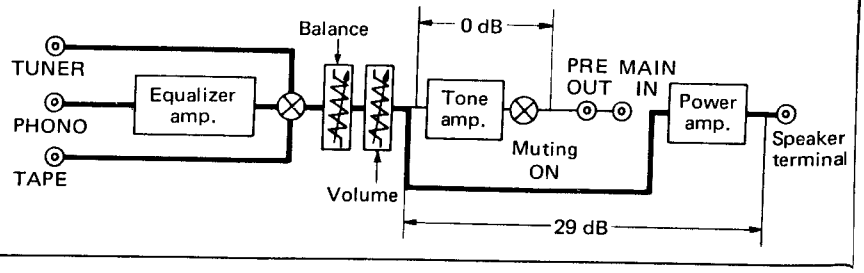
The main amplifier is a DC amplifier, and so even when the volume control ⑩ is turned down to its lowest position, a popping sound may be heard when the MAIN DIRECT switch is selected. There is no chance that DC components will leak into the speaker outputs but if you find the noise irritating, set the rear panel DIRECT COUPLING/CONDENSER COUPLING switch ㉜ to the CONDENSER COUPLING position.

⑦ MUTING switch

When the MUTING switch is set to the depressed (⊐) position, the green indicator above the switch comes on, and a 16 dB attenuation in the sound is produced. This switch is handy when you want to turn the sound down temporarily and you want to listen at low volume levels.

By using it together with the MAIN DIRECT switch ⑥, it is possible to achieve a high quality reproduction of music.

Operations of MAIN DIRECT switch ⑥ and MUTING switch ⑦

MAIN DIRECT switch ⑥	MUTING switch ⑦	Circuit connections and gain
OFF . . . released position (□)	OFF . . . released position (□)	
OFF . . . released position (□)	ON . . . depressed position (⊐)	
ON . . . depressed position (⊐)	OFF . . . released position (□)	 Balance 16 dB 16 dB gain up TUNER PHONO TAPE Equalizer amp. Tone amp. PRE MAIN OUT IN Muting OFF Power amp. Speaker termina Volume 45 dB
ON . . . depressed position (⊐)	ON . . . depressed position (⊐)	

⑧ LOW-FILTER switch

When the LOW FILTER switch is set to the depressed (⊓) position, the green indicator above the switch comes on.

When this switch is set to the 15 Hz (6 dB/oct.) (⊓) position, low frequency noise which is generated by warps in the records is cut out. It is wise to keep this switch at the 15 Hz (⊓) position since it is effective in cutting out low frequency noise outside the range of hearing which can adversely affect the speakers.

Since this amplifier features an ICL DC configuration, DC components flowing in a tuner or tape deck connected to the TUNER INPUT ㉓, AUX INPUT ㉔ or TAPE PLAY terminals ㉖, ㉗, ㉙ are amplified and this is the cause of popping noise and distortion. In cases like this, set the LOW-FILTER switch to depressed (⊓) and released (⊔), and if you can still hear the popping noise, set the switch to the depressed (⊓) position.

⑨ BALANCE control

Adjusts the balance of right and left channel levels.

⑩ Volume control (LEVEL ATTENUATOR)

This is used to adjust the volume. The maximum output power is achieved when this control is set to '0'.

The control features attenuation exactly like an attenuator and so it permits accurate volume adjustments in line with the display.

⑪ TAPE MONITOR switch

When playing back tapes, monitoring the quality of a recording while a tape is actually being recorded, or when dubbing tapes, set this switch as follows.

SOURCE . . . For listening to a program source selected by the FUNCTION switch ⑫ and for recording.

PLAY 1 . . . . For playing back a tape in tape deck 1 connected to the TAPE 1 terminals and for monitoring the quality of a recording.

PLAY 2 . . . . For playing back a tape in tape deck 2 connected to the TAPE 2 terminals and for monitoring the quality of a recording.

The positions below are used for when dubbing tapes.

1 ▷ 2 . . . . . A tape can be played back in tape deck 1 connected to the TAPE 1 terminals, and the contents recorded (dubbed) onto a tape in tape deck 2 connected to the TAPE 2 terminals.

There are two positions: "2" and SOURCE. When set to "2", the recording quality of the tape in tape deck 2 can be monitored. When set to SOURCE, the sound of the source selected by the FUNCTION switch ⑫ can be heard during tape dubbing.

2 ▷ 1 . . . . . A tape can be played back in tape deck 2 connected to the TAPE 2 terminals, and the contents recorded (dubbed) onto a tape in tape deck 1 connected to the TAPE 1 terminals.

There are two positions: "1" and SOURCE. When set to "1", the recording quality of the tape in tape deck 1 can be monitored. When set to SOURCE, the sound of the source selected by the FUNCTION switch ⑫ can be heard during tape dubbing.

⑫ FUNCTION switch

This selects the program source.

PHONO-1 . . . For hearing a record on the turntable connected to the PHONO-1 INPUT terminals ㉑.

PHONO-2 . . . For hearing a record on the turntable connected to the PHONO-2 INPUT terminals ㉒.

TUNER . . . . For listening to a broadcast on a tuner connected to the TUNER INPUT terminals ㉓.

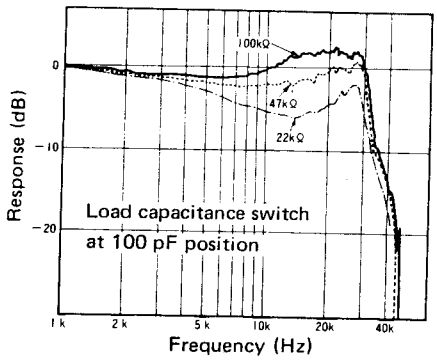
AUX . . . . . For listening to a program source on a component connected to the AUX INPUT terminals ㉔.

⑬ PHONO SELECTOR switches

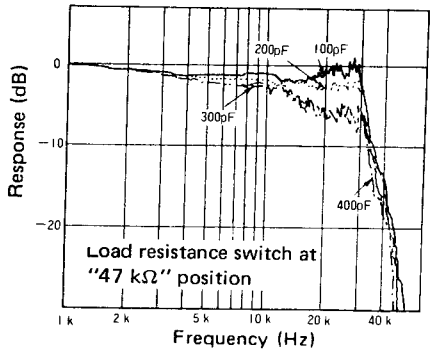
These two switches are selected in accordance with the cartridge of the turntable connected to the PHONO 1, 2 INPUT terminals ㉑, ㉒. The left-hand switch is for load capacitance and the right-hand switch is for load resistance. When an MM (moving magnet) cartridge is being used, the high-range frequency characteristics undergoes variations when the load capacitance and load resistance switches are selected, and so set them to the positions corresponding to the recommended values (or near the recommended values). If these values are not known, use "100 pF" and "47 kΩ" as a reference. Alternatively, set the switches to a position which provides a tone quality of your preference.

When an MC (moving coil) cartridge is being used, set to the 100 Ω-MC position. If the MC cartridge has a high output (over 1 mV), set the switches to the "100 Ω-MM" position.

Example: Frequency characteristics when the load resistance of Hitachi's MT-202MKII cartridge is selected.



Example: Frequency characteristics when load capacitance of Hitachi's MT-202MKII cartridge is selected.



⑭ MODE switch

REVERSE . . . . . The left and right channels of the sound are reversed.

STEREO . . . . . For stereo reproduction

MONO . . . . . The left and right channel signals are mixed and the same sound is heard through both speakers (monophonic reproduction).

⑮ TREBLE turnover switch

3 kHz . . . . . The TREBLE control ⑯ can be used to provide a ±8 dB treble adjustment at 10 kHz.

DEFEAT . . . A flat frequency characteristics is provided for the treble regardless of the TREBLE control's position.

6 kHz . . . . . The TREBLE control ⑯ can be used to provide a ±8 dB treble adjustment at 20 kHz.

⑯ TREBLE control

Operate this switch after the TREBLE turnover switch ⑮ is set to the "3 kHz" or "6 kHz" position.

When this control is rotated clockwise from the '0' position, the treble is emphasized, and when rotated counterclockwise, it is attenuated. When the MAIN DIRECT switch ⑥ is depressed (⊏), the TREBLE control cannot be adjusted for speaker output signals. It can be adjusted only for PRE OUT signals.

⑰ BASS control

Operate this switch after the BASS turnover switch ⑱ is set to the "150 Hz" or "300 Hz" position.

When this control is rotated clockwise from the '0' position, the bass is emphasized, and when rotated counterclockwise, it is attenuated. When the MAIN DIRECT switch ⑥ is depressed (⊏), the BASS control cannot be adjusted for speaker output signals. It can be adjusted only for PRE OUT signals.

⑱ BASS turnover switch

150 Hz . . . . . The BASS control ⑰ can be used to provide a ±8 dB adjustment at 50 Hz.

DEFEAT . . . A flat frequency characteristics is provided for the bass regardless of the BASS control's position.

300 Hz . . . . . The BASS control ⑰ can be used to provide a ±8 dB adjustment at 100 Hz.

⑲ SPEAKERS switch

A . . . . . The sound is heard from the speakers which are connected to the A speaker terminals.

B . . . . . The sound is heard from the speakers which are connected to the B speaker terminals.

A + B . . . The sound is heard from the speakers connected to the A and B speaker terminals.

When listening to the sound only with headphones, use the SPEAKERS OFF switch ⑤ to cut off the sound heard through the speakers.

⑳ Lid

To open the lid, press down on the bottom of the lid center.

㉜ DIRECT COUPLING/CONDENSER COUPLING switch

CONDENSER COUPLING

Set this switch to this position when DC components are leaking from equipment (such as the control amplifier) connected to the MAIN IN terminals*. Low-frequency signals below 4 Hz will be cut off and the DC components will be prevented from being applied to the speakers.

* How to check whether there is any DC component leakage . . . . . DC components are leaking if you hear a popping sound through the speakers when the DIRECT COUPLING/CONDENSER COUPLING switch is selected.

DIRECT COUPLING

This switch is normally kept at this position. The model will then function as a DC amplifier.

PROTECTION CIRCUITS

HITACHI have provided the following protection circuits for increased safety.

(1) Protection of the POWER MOS FET

In order to protect the POWER MOS FET, the area of safe operation detection circuit causes the relay to be actuated and the sound is no longer heard in cases when the SPEAKERS terminals ㉞ are shorted, or when the speakers are handling high inputs with a low load impedance (such as when 4-ohm speakers are connected to both SPEAKERS terminals ㉞ A and B and the SPEAKERS switch ⑲ is set at A + B). If this happens, set the POWER switch ① released (⊐), check whether the speaker connecting cords have been shorted, whether the speaker leads have been connected improperly, or whether the impedance is too low. Remedy the fault, and wait at least 1 minute after switching the POWER switch ① to released (⊐) before switching it on again. (If this switch is depressed (⊏) in less than 1 minute, the amplifier may not operate). If the relay is actuated again after the fault has been traced to a short and after it has been remedied, it means that there is a failure inside the amplifier. Get in touch with your nearest audio dealer or service station for repairs.

(2) Protection of the speakers

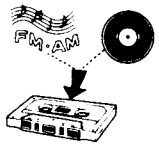
The speakers are damaged when DC voltage is generated at the SPEAKERS terminals ㉞. This is why the HA-8700 has a DC voltage detection circuit which actuates the relays and shuts off the speaker circuits, thereby protecting the speakers.

However, if DC voltage is generated, be sure to switch on the power after checking (1). If it does not operate normally, the fault may lie with the amplifier so contact your nearest audio dealer or service station for repairs.

CAUTION:

When supplying input signals without connecting the speakers, such as when listening to the sound with only the headphones, the protection circuit may be actuated if the volume control ⑩ is set to its maximum position or if the signals are completely clipped. This does not, however, indicate that something is wrong with the amplifier. Simply turn the volume control ⑩ down.

LISTING OF OPERATIONS

Objective	Connections	TAPE MONITOR switch ⑪	FUNCTION switch ⑫	Sound heard through speakers/headphones
Reception of broadcasts	Tuner → TUNER terminals	SOURCE	TUNER	Broadcast
Record play	Turntable → PHONO-1 or PHONO-2 terminals	SOURCE	PHONO-1 / 2	Record
Tape playback	Tape deck for playback → TAPE 1 terminals	PLAY 1	Any position	Playback sound from tape deck 1 • Tape deck 1 denotes that tape deck connected to the TAPE 1 terminals on the rear panel.
	Tape deck for playback → TAPE 2 terminals	PLAY 2		Playback sound from tape deck 2
Recording (broadcasts, records) * **Refer to NOTE** 	Tape deck for recording → TAPE 1 and/or TAPE 2 terminals	SOURCE	(Recording a broadcast) TUNER	Sound of source selected by FUNCTION switch ⑫
	Tape deck for recording → TAPE 1 terminals	PLAY 1		Sound recorded on tape deck 1 can be monitored.
	Tape deck for recording → TAPE 2 terminals	PLAY 2	(Recording records) PHONO-1 / 2	Sound recorded on tape deck 2 can be monitored.
Tape copy (1 ▷ 2)	Tape deck for playback → TAPE 1 terminals Tape deck for recording → TAPE 2 terminals	1▷2–2	Any position	Sound recorded on tape deck 2 can be monitored.
Tape copy (2 ▷ 1)	Tape deck for playback → TAPE 2 terminals Tape deck for recording → TAPE 1 terminals	1–2▷1		Sound recorded on tape deck 1 can be monitored.
Listening to a broadcast or record during tape copy (1 ▷ 2)	Tape deck for playback → TAPE 1 terminals Tape deck for recording → TAPE 2 terminals	SOURCE	Position corresponding to sound source	Sound from source selected by FUNCTION switch ⑫ (broadcast or record)
Listening to a broadcast or record during tape copy (2 ▷ 1)	Tape deck for playback → TAPE 2 terminals Tape deck for recording → TAPE 1 terminals	SOURCE		
Recording of a broadcast or records during tape playback	Tape deck for playback → TAPE 1 terminals Tape deck for recording → TAPE 2 terminals	PLAY 1	Set to recording sound source	Playback sound from tape deck 1 • The recording sound can be monitored when the TAPE MONITOR switch ⑪ is set to PLAY 2.
	Tape deck for playback → TAPE 2 terminals Tape deck for recording → TAPE 1 terminals	PLAY 2		Playback sound from tape deck 2 • The recording sound can be monitored when the TAPE MONITOR switch ⑪ is set to PLAY 1.

* NOTE:
The recording level is adjusted with the tape deck's recording level controls.
When recording the sound of a broadcast or of a record, the volume control, bass control and treble control adjustments on the model will have no affect on the sound which is recorded.
The programs you record may be used for your own personal entertainment but copyright laws prohibit use without permission for personal gain.

■ **Tape monitoring**

When your tape deck features a 3-head system (independent erase, recording and playback heads), set the tape deck's monitor switch to TAPE and you will be able to compare the recorded sound with the sound just before recording by switching the TAPE MONITOR ⑪ on this model to SOURCE and PLAY 1 or PLAY 2. This function enables you to check the quality of the recording accurately, and the operation is known as tape monitoring.
When the TAPE MONITOR switch ⑪ is set to SOURCE, the sound just before it is recorded is heard through the speakers. When the switch ⑪ is set to PLAY 1 or PLAY 2, the sound you have just recorded is heard through the speakers. This is the monitoring sound which allows you to check the quality of the recording.
CAUTION:
When recording and monitoring, separate recording and playback cords are required.

Handling tips

- In order to protect your speakers, turn the volume right down when changing over records, when raising or lowering the pickup and when turning the POWER switch ① depressed (⊓) and released (⊔).
- When the switches and volume control ⑩ are moved directly after (less than 10 seconds) the POWER switch ① has been depressed (⊓), noise may be heard through the speakers or headphones. This does not, however, indicate failure.
- If you hear an irritating hum, it may sometimes be reduced by disconnecting the power plug and reconnecting it with the points reversed in the power outlet.

Use of the PRE OUT Jacks and the MAIN IN Jacks

Use these jacks when using the preamplifier, or power amplifier, separately.

Connecting plug

Use this plug to connect the power amplifier to preamplifier It is usually kept connected. However, disconnect it when using the preamplifier or the power amplifier separately. Always turn the switch on your power amplifier to OFF when you intend to use the preamplifier separately before operating the power switch on this amplifier.
CAUTION:
When using the MAIN IN and PRE OUT terminals separately, first set the model's power switch to the OFF position, and then disconnect the connecting plug and insert the pin plugs of the components which are to be connected. Now check that the equipment is connected properly and proceed to operate the mode.
If the connections are performed with the model's power switch set to ON the speakers will be subjected to a high input level and they may sustain some damage.
MAIN IN terminals ㉛ cannot be used when the MAIN DIRECT switch ⑥ is set to the depressed (⊓) position.

WHAT TO DO IF?

A variety of problems may result from the mishandling of the amplifier.
When a problem occurs, check the table below which describes possible problems occurring in your amplifier. Since the amplifier is completely checked and adjusted before shipping, there are no user serviceable and adjustable parts inside. But if the amplifier is not operating correctly and you are unable to restore normal operation by following the detailed procedure in the table below, do not remove the cover of the set or attempt any further adjustments. Unplug the set and contact your dealer or nearest HITACHI service station.

	SYMPTOM	DIAGNOSIS	REMEDY
NORMAL PLAYING	Power indicator does not come on and the sound is not heard although the power switch is set to ON.	1. AC line plug is loose. 2. Fuse blown.	1. Plug the AC line plug into AC outlet. 2. Replace the fuse.
	POWER indicator ② comes on, PROTECTION indicator ③ goes off but no sound is heard.	1. The speaker cords are loose. 2. The tape monitor switch is set to except SOURCE.	1. Connect the speaker cords to the speaker terminals securely. 2. Set the tape monitor switch to SOURCE.
	Sound heard through only one channel.	1. The speaker cord of one channel is loose. 2. BALANCE control is turned fully clockwise or counterclockwise.	1. Connect the speaker cord to the speaker terminals securely. 2. Set the BALANCE control to the midway position.
	Sound separation is not distinct and bass is poor.	1. Polarities of the speaker connections are not aligned properly.	1. Correct the polarities on either of the speakers.
PLAYING RECORDS	The sound of both channels or one channel is not heard.	1. Faulty connection of the output cords of the turntable.	1. Connect the output cords of the turntable to the amplifier securely.
	Hum and buzz.	1. Faulty connection of the output cords of turntable. 2. Pin jack connection is loose. 3. Ground wire is loose. 4. There is a AC line cord near the output cords of turntable.	1. Connect the output cords of the turntable to the amplifier securely. 2. Connect the pin plug to the pin jack securely. 3. Connect the ground wire of the turntable to GND terminal of the amplifier securely. 4. Separate the AC line cord from the output cords of the turntable.
	Increasing the volume causes howl.	1. Sound of the speakers is making the turntable vibrate.	1. Move either the speakers or turntable. Do not increase the BASS sound level excessively.
	Output tone is mixed with noise and treble is not clear.	1. Stylus is worn out. 2. Record is worn out. 3. Dust is adhering to stylus. 4. Stylus is improperly mounted. 5. Tracking force is not correct. 6. The TREBLE sound is too high.	1–6. Correct the conditions trouble concerned.
LISTENING TO BROADCASTS	Continuous noise in AM.	1. Static. 2. Noise caused by other electric appliances.	1, 2. Set up a good and high outdoor antenna and ground it perfectly.
	Only when tuning AM broadcasts, hum noise is heard.	1. Generally caused by high voltage lines or other electric appliances.	1. By reversing the polarity of AC line plug, the hum is reduced. But it is very difficult to remove this noise completely.
	Continuous or intermittent noise.	1. Ignition noise from automobile engines.	1. Set up an outdoor FM antenna instead of using attached FM feeder antenna.
	The sound of FM program contains noise like zzz. More noise is included in FM stereo reception than FM mono.	1. The signal input of antenna terminals is too weak to receive FM stereo broadcasts.	1. Set up an outdoor FM antenna.

SPECIFICATIONS

POWER AMPLIFIER SECTION

Power output 90 watts minimum RMS per channel, both channels driven into 8 ohms load from 20–20,000 Hz with no more than 0.02% total harmonic distortion.

Rated Power Output (both channels driven)		
(8 ohms, 1 kHz, 0.01% THD):		100 watts + 100 watts
(4 ohms, 1 kHz, 0.01% THD):		130 watts + 130 watts
Power Band Width:		5 Hz–100 kHz (0.02% THD)
Frequency Response		
Direct Coupling:		DC–100 kHz +0, -1 dB
Condenser Coupling:		4 Hz (6 dB/Oct)
Total Harmonic Distortion (20 Hz-20 kHz, 8 ohms from MAIN IN)		
at 90 watts output:		0.02%
at 1/2 rated output:		0.005%
Intermodulation distortion (60 Hz: 7 kHz, 4:1)		
at 90 watts output:		0.008%
at 1/2 rated output:		0.003%
Input Sensitivity/Impedance:		1 V/47 kohms
Input Terminals:		Direct Coupling/ Condenser Coupling (Selected by Rear Panel Switch)
Output Terminals:		A or B Speakers
Signal-to-Noise Ratio IHF, Short-Circuited, A network, Rated Power:		115 dB
Damping Factor 8 ohms, 1/2 rated output:		80 (1 kHz) 60 (20 Hz–20 kHz)
Channel Separation 1 kHz, 8 ohms:		75 dB (4.7 kohms short)
Speaker Impedance:		4 ohms – 16 ohms
Phones Impedance:		More than 4 ohms

PREAMPLIFIER SECTION

Input Sensitivity/Impedance		
Phono 1,2:	MM	2.5 mV/ (100 ohms, 22 kohms, 47 kohms, 100 kohms, 100 pF, 200 pF, 300 pF, 400 pF)
	MC	250 μV/100 ohms
Tuner, AUX:		150 mV/47 kohms
Tape play 1,2:		150 mV/47 kohms [Tape play 2 (DIN): 150 mV/47 kohms (Except for U.S.A. & Canada)]
Maximum Input levels (1 kHz, 0.005% THD)		
Phono 1,2:		MM 300 mV MC 30 mV
Output Level/Impedance		
Pre-out:		1V/600 ohms
Tape REC out 1,2:		150mV/600 ohms [Tape REC out 2 (DIN): 50 mV/80 kohms (Except for U.S.A. & Canada)]
Maximum Output Levels (20 Hz–20 kHz, 0.01% THD)		
Pre-out:		More than 7V- (MUTING: OFF)
Frequency Response		
Phono:		20 Hz–20 kHz, ±0.2 dB
Tuner, AUX:		10 Hz–100 kHz, +0, -2 dB
Signal-to-Noise Ratio (IHF, Short-Circuited, A Network, Rated Power)		
Phono 1,2:		MM 90 dB, MC 73 dB
Tuner, AUX:		100 dB
Tape Play 1,2:		100 dB
Harmonic Distortion		
Phono 1,2:		MM 0.005% (20 Hz – 20 kHz at REC out Level 10 V) MC 0.005% (20 Hz – 20 kHz at REC out Level 10 V)
Tuner, AUX, TAPE 1, 2:		0.005% (20 Hz–20 kHz at PRE out Level 1 V)
Tone Control		
Bass boost/cut:		±8 dB (50 Hz, 100 Hz/turnover frequency 150 Hz, 300 Hz)
Treble boost/cut:		±8 dB (10 kHz, 20 kHz, turnover frequency 3 kHz, 6 kHz)
Filter		
Low (Subsonic Filter):		15 Hz (6 dB/oct)
Muting		-16 dB
Premain Separable		(PRE OUT, MAIN IN terminals)

GENERAL

Dimensions (W x H x D):	435 x 164.5 x 420 mm (17-1/8" x 6-3/8" x 16-3/8")
Weight:	20 kg (44 lbs.)
Power consumption:	510 W, 640 VA (at 1/3 rated output) 800 W (at rated output)
Power requirements:	AC 120 V 60 Hz, ~220 V 50/60 Hz ~240 V 50/60 Hz, ~120 V/220 V/240 V 50/60 Hz

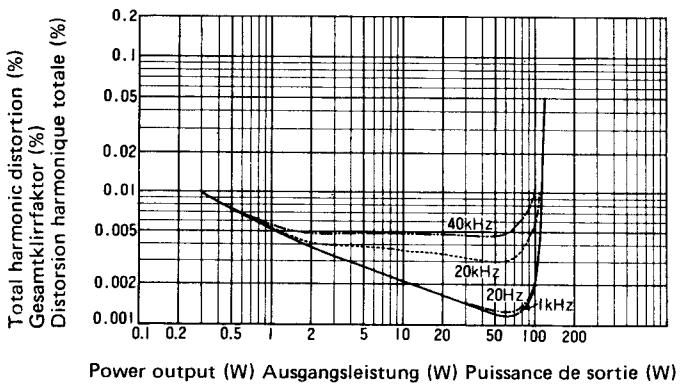
Specifications subject to change without notice

Power output vs. Total Harmonic Distortion Characteristics
Ausgangsleistung im Vergleich zum Gesamtklirrfaktor
Puissance de sortie contre distorsion harmonique totale

Input: MAIN IN terminal
Output: 8 ohms load, both channels driven

Eingang: Eingangsklemmen (MAIN IN)
Ausgang: 8 Ohm Belastung, beide Kanäle betrieben

Entrée: Borne MAIN IN
Sortie: Charge de 8 ohms les deux canaux en fonctionnement

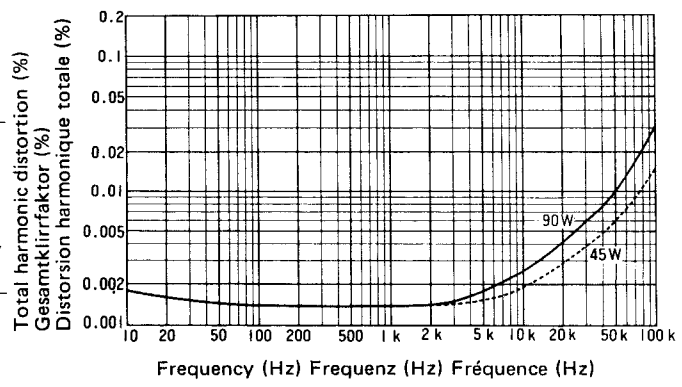


Frequency vs. Total Harmonic Distortion Characteristic
Frequenz im Vergleich zum Gesamtklirrfaktor
Fréquence contre distorsion harmonique totale

Input: MAIN IN terminal
Output: 8 ohms load, both channels driven, 90 W, 45 W

Eingang: Eingangsklemmen (MAIN IN)
Ausgang: 8 Ohm Belastung, beide Kanäle betrieben, 90 W, 45 W

Entrée: Borne MAIN IN
Sortie: Charge de 8 ohms les deux canaux en fonctionnement, 90 W, 45 W

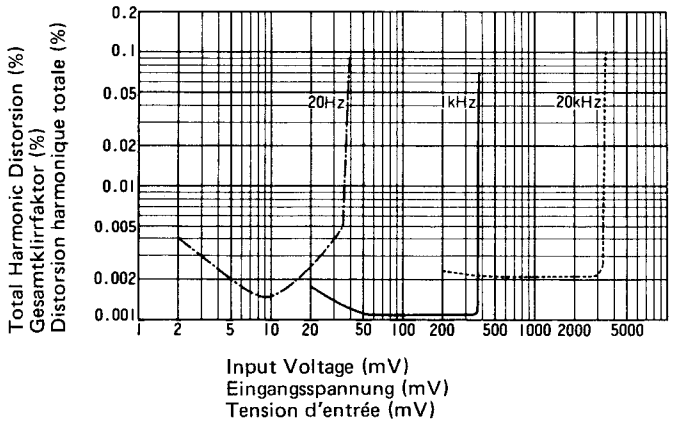


Input vs. Total Harmonic Distortion Characteristics
Eingangsleistung im Vergleich zum Gesamtklirrfaktor
Entrée contre distorsion harmonique totale

Input: PHONO 1 (MM) terminal
Output: REC OUT terminal

Eingang: PHONO 1 (MM)-Anschlüsse
Ausgang: Aufnahmeausgangsanschluß (REC OUT)

Entrée: Borne PHONO 1 (MM)
Sortie: Borne REC OUT

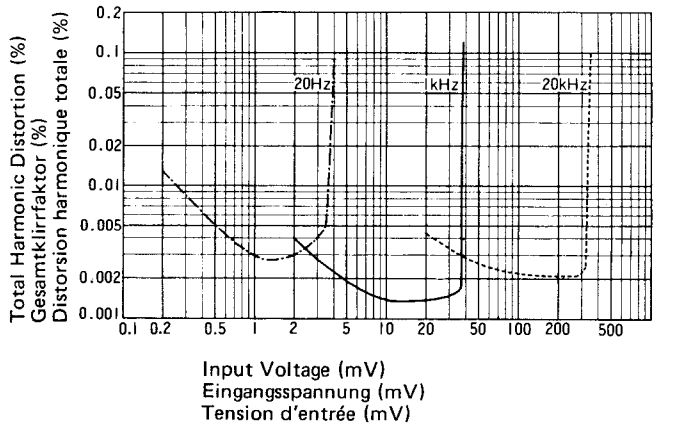


Input vs. Total Harmonic Distortion Characteristics
Eingangsleistung im Vergleich zum Gesamtklirrfaktor
Entrée contre distorsion harmonique totale

Input: PHONO 1 (MC) terminal
Output: REC OUT terminal

Eingang: PHONO 1 (MC)-Anschlüsse
Ausgang: Aufnahmeausgangsanschluß (REC OUT)

Entrée: Borne PHONO 1 (MC)
Sortie: Borne REC OUT



Measuring Equipment
Audio Osc.: MODEL 4494A
AC Voltmeter: MODEL 3400A
Distortion Meter: MODEL 4333A

Meßgeräte
Tonfrequenzgenerator: Modell 4494A
Wechselstrom-Voltmeter: Modell 3400A
Klirrfaktormesser: Modell 4333A

Equipement de mesure
Générateur à basse fréquence: Modèle 4494A
Voltmètre CA: Modèle 3400A
Appareil de mesure: Modèle 4333A

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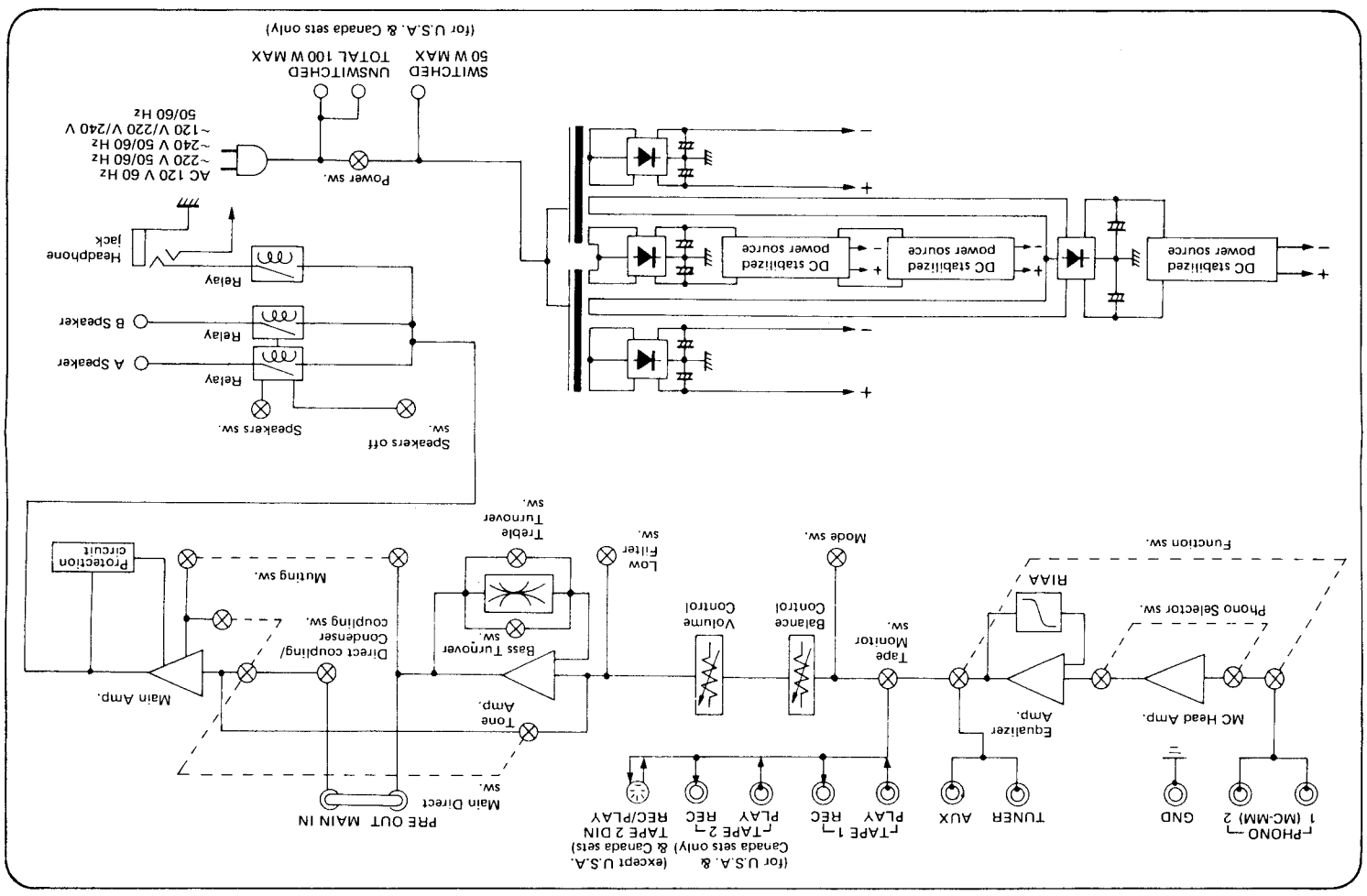
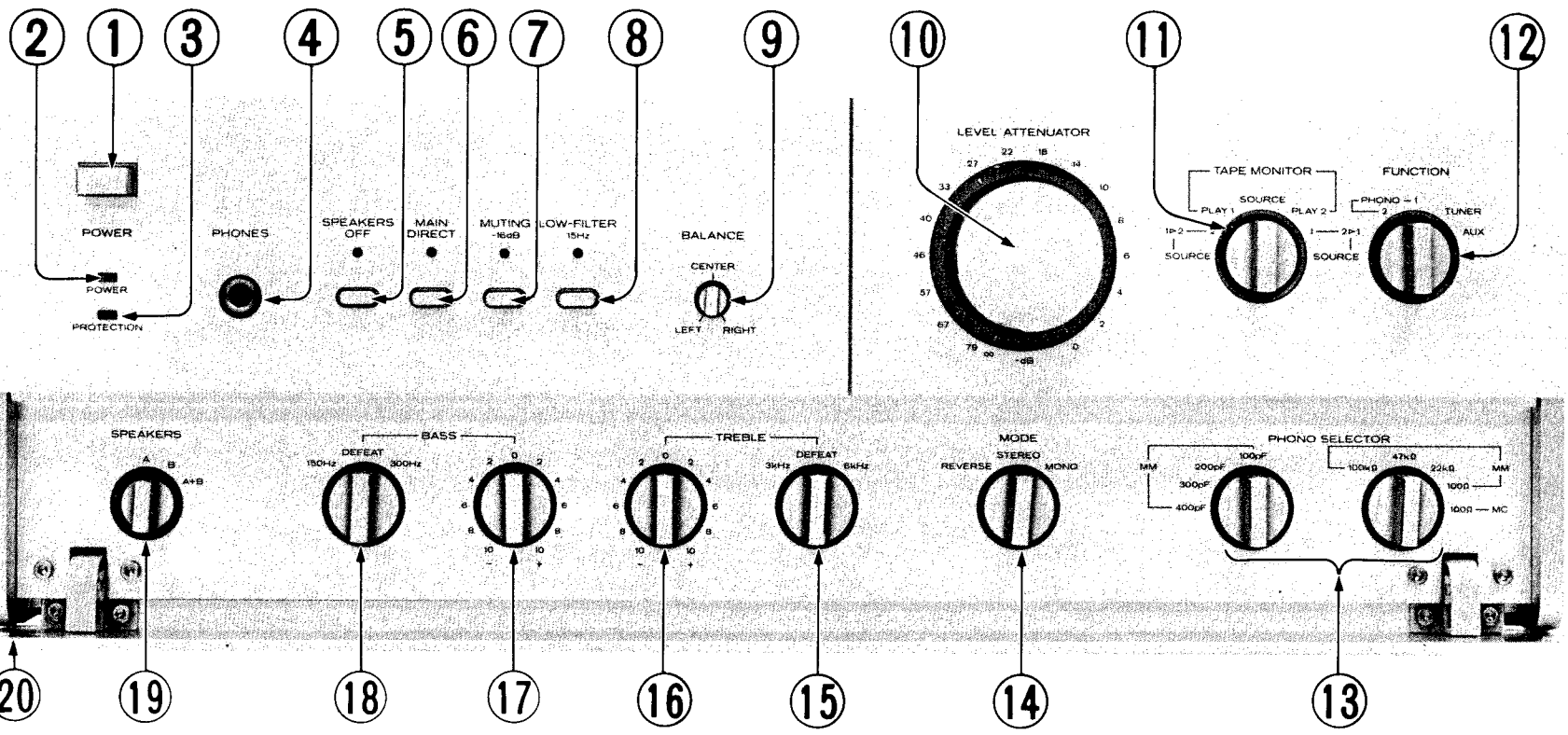


One channel only shown.

HA-8700

HITACHI



FM STEREO TUNER
UKW-STEREO TUNER
TUNER STEREO FM
TAPE DECK
TONBANDGERÄT
MAGNETOPHONE
LOUDSPEAKER SYSTEM
LAUTSPRECHERSYSTEM
ENCEINTES ACOUSTIQUE
LINE OUT
LINE IN
LINE IN
LINE OUT
L
R
INPUT
RIGHT
LEFT
AUX
PHONO-2
PHONO-1
REC
TAPE 1
PLAY
PRE OUT
MAIN IN
MADE IN JAPAN
SERIAL No.
VOLTAGE SELECTORS
RIGHT
LEFT
220 V
Ground wire
(Earth wire)
Erdung
Fil de prise de terre
TURNTABLE
PLATTENSPIELER
TOURNE-DISQUE
Connecting plug
See "CAUTION" on Page 9.
Anschlußstecker
Siehe "VORSICHT" auf Seite 10.
Prise de branchement
Voir "ATTENTION" à la page 10.
AC outlets: The HA-8700 has a SWITCHED 50 watts max. outlet and two UNSWITCHED TOTAL 100 watts max. outlets. (for U.S.A. & CANADA sets only.)
Wechselstromausgänge: Der HA-8700 hat eine Steckdose für max. 50 Watt (SWITCHED) und zwei Steckdosen für insgesamt max. 100 Watt (UNSWITCHED). (Nur für USA und Kanada Modelle)
Sorties CA: Le HA-8700 possède une sortie commutable de 50 Watts maximum et deux sorties non-commutables de 100 Watts maximum au total (seulement pour les appareils vendus aux U.S.A. ou au Canada).
PHONO-2 terminals are provided with shorting pin plugs. Remove all plugs when using terminals. When the PHONO-2 terminals are not being used return the shorting pin plugs to their original positions. Insert the plugs which you have removed into any of the unused terminals except the REC terminals or store them in a safe place. If they are plugged into the REC terminals, the sound will be cut off.
Die Ausgangsbuchsen für Tonbandgeräte PHONO-2 sind mit Kurzschlußsteckern versehen. Bei Verwendung aller Anschlußbuchsen alle Kurzschlußstecker entfernen. Wenn die Anschlußbuchsen PHONO-2 nicht benutzt werden, die Kurzschlußstecker wieder in die Buchsen stecken. Die abgezogenen Stecker in beliebigen freien Anschluß einstecken, ausgenommen die REC-Anschlüsse oder an einem sicheren Ort aufbewahren. Werden Sie in die REC-Anschlüsse eingesteckt, wird die Klangwiedergabe unterbrochen.
Les Bornes PHONO-2 sont équipées de fiches de mise en court-circuit. Retirer toutes les fiches quand on utilise ces bornes. Lorsque les bornes PHONO-2 ne sont pas utilisées, remettre les fiches à broches de court-circuit sur leurs positions initiales. Introduire les prises que vous venez d'einlever dans l'une quelconque des bornes inutilisées à l'exception des bornes d'enregistrement (REC) ou les ranger en lier sûr. Si l'on branche ces prises dans les bornes d'enregistrement, le son sera coupé.
Any hum caused when the power amplifier installed near this model can be reduced by unplugging the power plug of this amplifier and/or power amplifier, turning it upside down and plugging it in again.
Falls dieses Gerät in der Nähe des Leistungsverstärkers aufgestellt wird und Brummgeräusch zu hören ist, den Netzstecker von Steuerverstärker und/oder Leistungsverstärker herausziehen und in umgedrehter Stellung wieder einstecken. Dadurch wird im allgemeinen das Brummen reduziert.
On peut réduire un ronflement quelconque apparaissant quand l'amplificateur de puissance est placé près de ce modèle, en débranchant la prise d'alimentation secteur de l'amplificateur de commande et/ou de l'amplificateur de puissance, puis en le retournant complétement une fois et en le rebranchant.
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